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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,137	06/08/2001	Clifford L. Temes	77,119	1267

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EXAMINER

ALSOMIRI, ISAM A

ART UNIT	PAPER NUMBER
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3662

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/876,137

Applicant(s)

TEMES ET AL.

Examiner

Isam A Alsomiri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Drawings

New Formal drawings are required in this application. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The Formal drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 10, 12, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117.

Referring to claims 1-2 and 12-13, Sunlin discloses in figures 1 and 4-5 a radar system comprising: an aircraft for detecting buried objects from the air, for overflying a target area of interest (figure 1), a radar transmitter, carried by the aircraft (figure 1); a plurality of radar receiving antennas, carried by the aircraft and forming an antenna array for receiving a reflected signal produced by reflection of said radar signal (see col. 2 lines 20-25), and a processor 88 for generating a three-dimensional image of said object from the reflected signal (see Abstract). Sunlin is silent about producing a radar signal of a frequency of at least three gigahertz.

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However, a radar frequency of 3 GHz is well known in ground penetrating radars (GPR).

Gogineni teaches using 2 to 18 GHz, which reads on the claimed producing a radar signal of a frequency of at least three gigahertz (see col. 11 lines 13-15). It would have been obvious to modify Sunlin to use 3 GHz for better and stronger return signals and detection of the underground objects.

Referring to claims 3, Sunlin teaches the processor performs synthetic aperture beam processing based on movement of said radar transmitter and said antenna array relative to the target (see figures 4-5).

Referring to claim 4, Sunlin is silent about the radar transmitter comprises a frequency-stepped pulse compression radar unit. Gogineni teaches the frequency stepped pulse compression radar unit (see col. 11 lines 13+).

Referring to claim 5, Sunlin teaches the radar transmitter comprises an impulse-modulated radar unit (see Abstract).

Referring to claim 10, it's inherent that the process comprises an on-board processor disposed on the aircraft (see figure 5).

Referring to claim 14, Sunlin teaches identifying the object from the three-dimensional image (see col. 1 lines 20-25, col. 2 lines 40-47).

Referring to claim 17, Sunlin does not teach selecting a desired transmitting frequency to maximize image resolution. Gogineni teaches selecting a desired transmitting frequency to maximize image resolution (see col. 7 lines 6-15). It would have been obvious to modify Sunlin's system to include selecting the frequency to obtain better quality image with higher resolution.

Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117 as applied to claim 1 above, and further in view of von Maydell et al. US 4,675,677. Sunlin does not teach the aircraft includes wings and said array is disposed along said wings. However, using aircraft with wings is well known in the art for GPR. Maydell teaches an aircraft with wings and an array of receivers are used for GPR (see figure 1). It would have been obvious to modify Sunlin's system to include the aircraft with wings to detect a wider coverage area.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117 and Maydell et al. US 4,675,677 as applied to claim 6 above, and further in view of Smethers, Jr. US 4,797,680. Referring to claim 7, the combination of Sunlin, Gogineni, and Maydell does not teach the claimed boom extending outwardly from the aircraft wings and include the sensor array on the booms. Smethers teaches at least one mountable boom extending from both sides of the wings which include radar emitters or receivers (see figure 1 [12], col. 2 lines 34-37); the boom in Smethers' system extend from each side of the wings, each connection to the wing is a boom. Furthermore, having booms extending laterally from aircraft wings for mounting sensors, antennas or the like is well known in the art. It would have been obvious to modify the combination to include extending booms for bigger and better terrain coverage

Referring to claim 8, Smethers teaches the booms as mentioned above, which is attached to the aircraft (mountable providing the necessary attachment members 15 and 17); therefore it is extendable booms by way of attaching it to the aircraft (see col. 3 lines 49-62);

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therefore, it reads on the claimed “extendable booms”. It would have been obvious to modify the combination to include extending booms for bigger and better terrain coverage.

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117 as applied to claims 1 and 12 above, and further in view of von Witten US 2003/0076254. Sunlin is silent about the signal processor filters a portion of the reflected signal corresponding to reflection from the surface of the target area. However, it is inherent that Sunlin filters the unwanted signals from the surface of the target area; otherwise detecting the buried objects would not be possible. Even if it is not inherent it would be obvious for the same reasons. Witten teaches a GPR including filtering out the portion of the reflected signal corresponding to reflection from the surface of the target area (see paragraph [0076]). It would have been obvious to modify Sunlin’s system to include filtering the unwanted signals from the surface of the area to clearly discriminate the target from noises.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117 as applied to claims 1 above, and further in view of von Thornton US 6,626,078. Sunlin is silent about the processor comprises an off-board Processor. However, off-board processors are well known. Thornton teaches a GPR system wherein a control station control an aerial platform capable of powered flight for sensing underground objects and communicates that with the control station (off-board

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processor) (see Abstract, figure 1). It would have been obvious to modify Sunlin's system to include an off-board processor to process the signals and to control the aircraft.

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunlin et al. US 5,900,833 in view of Gogineni et al. US 5,867,117 as applied to claim 14 above, and further in view of Moussally et al. US 5,673,050. Referring to claims 15-16, Sunlin does not teach identifying the object comprises the step of comparing the generated three-dimensional image to a stored image. Moussally teaches comparing the generated three-dimensional image to a stored image (see col. 2 line 64 – col. 3 line 2). It would have been obvious to modify Sunlin's system to include the comparing step for more accurate detection and identification of buried objects.

Referring to claim 16, Moussally teaches identifying the buried (3D image) objects; which can be a mine (see Abstract, col. 3 lines 37-44).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited to (Miceli et al.; Ulander; McGill; Michiguchi et al.) show various GPR systems on a flying platform for mapping a target area and locating underground objects.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam A Alsomiri whose telephone number is 703-305-5702. The examiner can normally be reached on Monday-Thursday and every other Friday (8:30-5:00).

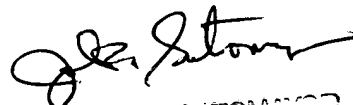
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H Tarcza can be reached on 703-306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri



April 7, 2004


JOHN D. COTNAM
PRIMARY EXAMINER